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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,662

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Takuya Tsukagoshi

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OLIFF & BERRIDGE, PLC  
P.O. BOX 320850  
ALEXANDRIA, VA 22320-4850

EXAMINER

CHANG, AUDREY Y

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/583,662	<b>Applicant(s)</b> TSUKAGOSHI ET AL.	
	<b>Examiner</b> Audrey Y. Chang	<b>Art Unit</b> 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Remark*

- This Office Action is in response to applicant's amendment filed on July 1, 2008, which has been entered into the file.
- By this amendment, the applicant has amended claims 1, 5-9, 13, and 15 and has canceled claim 20.
- Claims 1-19 and 21 remain pending in this application.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 15 and 16 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims fail to disclose how could the crosstalk hologram be recorded with the same optical system yet the crosstalk layer has no sensitivity to the object and reference beams from the same optical system for recording the data hologram.

### *Claim Objections*

3. **Claims 7 and 12-14 are objected to because of the following informalities:**

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(1). Claim 7 has been amended to include a phrase of "an object beam for erasing and a reference beam fro erasing". It is therefore not clear the phrase "the object beam ... the reference beam" recited in claim 7 and "an object beam" recited in claim 13 are confusing since it is not clear what are these object bam and reference beam. It is not clear if they are object bam and reference beam for erasing or for recording the data hologram?

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Moss et al (PN. 5,162,927) in view of the patent issued to Colvin et al (PN. 6,322,932).**

***Claim 1 has been significantly amended that necessitates the new grounds of rejections.***

Moss et al teaches a holographic recording medium having recording layer (10, Figures 1-4) that is provided on a substrate (14). Moss et al teaches that a non-photosensitive layer (24) serves as the crosstalk layer is provided directly on the recording layer, wherein the crosstalk layer is non-sensitive or with low sensitive to the recording beam of the data hologram in recording layer (10). Moss et al teaches that the non-photosensitive layer is formed or prepared by using dichotic holographic gelatin, the same dichromate gelatin used for the recording layer (10 and 18), and using ultraviolet light as gate beam to make it non-photosensitive as the crosstalk layer, (please see columns 7, line 50 to column 8, line 25). Moss et al teaches that the crosstalk layer has a thickness of about 2 to 5 microns which is 0.48 microns or greater.

This reference has met all the limitations of the claim with exception that it does not teach explicitly that the holographic recording layer is interposed between first and second substrates. However it is known in the art to use two substrates to interpose two holographic recording layers as explicitly taught by **Colvin** et al wherein the holographic recording layers are interposed between two substrates (1, Figure 1). It would then have been obvious to one skilled in the art to apply the teachings of Colvin et al to add an additional substrate for the benefit of protecting the holographic recording layers from possible noise introduced by the environment.

The dichromate gelatin holographic recording material is implicitly capable for multiplexing recording.

With regard to claim 2, Moss et al does not teach explicitly about the actual thickness of the recording layer. Colvin et al teaches holographic recording medium has active recording layer and crosstalk layer, having a thickness of about 10  $\mu\text{m}$  to 3 mm. Colvin et al teaches, with the incorporated reference of US patent 5,719,691, that holograms can be recorded via angular multiplexing, (please see column 2, line 65, and column 1 line 20-22 of patent 5,719,691). Colvin et al teaches that the minimum angle separation for a data page to be recorded angular multiplexing manner is ( $\Delta\theta = \lambda/L$ ), L being the thickness of the recording layer and  $\lambda$  being the wavelength of the recording light beam, (please see column 1, line 40). This means N (number of holograms recorded) cannot be greater than ( $L/\lambda$ ). It is implicitly true that the thickness of the crosstalk layer could be made less than the thickness of the active layer divided by number of the holograms recorded.

With regard to claim 3, as shown in Figure 4, the crosstalk layer or the non-sensitive layer (24) is arranged at the back side of the holographic recording layer (18) with respect to the incidence side of the object and reference beams.

With regard to claim 4, Moss et al teaches that the non-photosensitive layer or the crosstalk layer (24) is interposed between two holographic recording layers (10 and 18).

6. **Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Moss et al and Colvin et al as applied to claim 1 above, and further in view of the patent issued to Mitzutani et al (PN. 6,483,611)..**

The holographic media taught by Moss et al in combination with the teachings of Colvin et al as described for claim 1 above have met all the limitations of the claims.

With regard to claims 5 and 6, these references however do not teach explicitly to further include a spacer layer. Mitzutani et al in the same field of endeavor teaches a holographic laminate wherein a polymeric film (121 or 122, Figure 9) is provided wherein the polymeric film is resin base for provide stability of the holographic laminate, (please see column 13, lines 26-32). It would then have been obvious to one skilled in the art to apply the teachings of Mitzutani et al to modify the holographic media of Moss et al for the benefit of providing additional stability to the media.

7. **Claims 7, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Jannson et al (PN. 4,958,892) in view of Moss et al (PN. 5,162,927).**

**Claim 7 has been significantly amended to necessitate the new grounds of rejections.**

**Jannson** et al teaches a holographic erasing method wherein the method is comprised of forming a second expose grating, serves as the crosstalk hologram (Figure 14A), that is superimposed on a first expose grating, serves as the data hologram. The superposition of the first and second expose gratings or the data hologram and the crosstalk hologram would cause erasing of the first grating or the data hologram at intermediate regions or the spacer layers, (please see Figure 14B). The resultant holographic recording medium then has alternatively arranged hologram recording layers or the subhologram layer and spacer layer, (please see Figure 11A). The spacer layers serves as the crosstalk layer wherein the crosstalk or *the second expose grating would form*.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the spacer layer or the crosstalk layers are made to have no sensitivity to the reference beam and object beam for recording the data hologram or the first expose grating. But the resultant spacer layers are *essentially* insensitive to the object beam and reference beam for recording the first grating since it is saturated. **Moss** et al in the same field of endeavor teaches a holographic medium that is comprised of alternatively arranged holographic recording layer (10 and 18) and desensitized regions (24, 28 Figure 4), serves as the crosstalk layers. The desensitized layers or regions are formed by desensitized *portion of the holographic recording layers* it is then has low or none sensitivity to the original object and reference beams for recording the data hologram, (please see column 7, lines 38-69). It would then have been obvious to one skilled in the art to apply the teachings of Moss et al to make the spacer layers desensitized to have no sensitivity to the original object and reference beam for the benefit of making the spacer layers a stable spacer for separating the subholograms.

**Claim 7 has been amended to** include the phrase that the crosstalk layer is formed of one of the materials cited in the claim. Moss et al teaches that the non-photosensitive layer or crosstalk layer (24) is formed or prepared by using *dichotic holographic gelatin*, the same dichromate gelatin used for the recording layer (10 and 18), and using ultraviolet light as gate beam to make it non-photosensitive as the crosstalk layer, (please see columns 7, line 50 to column 8, line 25).

With regard to claim 12, it is implicitly true that the second expose grating is formed with certain amplitude modulation.

With regard to claim 13, it is obvious within the general skill level of ordinary worker in the art to use desired optical elements to modulate the recording beam.

**8. Claims 15-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to the patent issued to Colvin et al (PN. 6,322,932) in view of the patent issued to Chern et al ( PN. 4,815,800).**

***Claim 15 has been amended that necessitates the new grounds of rejection.***

Colvin et al teaches a holographic recording and reproducing apparatus that is comprised of holographic recording layer (3, Figure 1) provided between a first and second substrate (1), wherein the recording apparatus further comprises a laser beam source, (implicitly included in Figure 2), and an object optical system (object beam 15, 29, 21, 17, 23 and 22) and a reference beam optical system (reference beam 11, 10, 18, 25 and 17, Figure 2), for guiding the object beam (15) and reference beam (11), splitted from a laser beam to the holographic recording medium (13). The interference of the object beam and the reference beam at the recording medium therefore forms the data hologram and recorded therein. It is implicitly true that the reconstruction of the hologram is achieved by sending reconstructing reference beam unto the holographic medium via the reference beam path.

Colvin et al teaches that the holographic media (Figure 1) is further comprised of an inactive layer (2) serves as the *crosstalk layer* provided directly on the recording layer (3) wherein the inactive layer exhibit no or low sensitivity to the interference fringes of an object beam and reference beam at time of recording data hologram in the recording layer or active layer, (please see Figure 1 and column 3, lines 27 to 65). Colvin et al teaches that the holographic recording medium or the active layer is capable of multiplex recording, (please see column 2, lines 64-65).

**Claim 15 has been amended** to include the crosstalk layer is formed of one of the materials cited in the claim 15. Chern et al in same field of endeavor teaches a holographic recording medium having a plurality of holographic recording layers wherein the surface of each layer is harden by a gate beam to make it a non-photosensitive layer or crosstalk layer such the crosstalk layer has a graduate reduction of sensitivity to the recording beam of the data hologram in recording layer, (please see column 3,lines 20-



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43). Chern et al teaches that the crosstalk layer is formed or prepared by using dichroic holographic gelatin, the same dichroic gelatin used for the recording layer, and using gate beam to expose it to make it with graduate reduced sensitivity to the recording beam as the crosstalk layer. It would then have been obvious to one skilled in the art to apply the teachings of Chern et al to modify the inactive layer of Colvin et al to use a portion of the holographic recording layer as the crosstalk layer for the benefit of reducing manufacturing cost by eliminating the use of other material for the crosstalk layer.

Colvin et al also does not teach explicitly that an erasing optical system providing erasing object beam and erasing reference beam to form crosstalk hologram in the crosstalk layer. But the claims 15-16, states that the erasing optical system is the same as the recording optical system. This means certain crosstalk hologram is formed in the crosstalk layers. One skilled in the art would understand that the object beam and reference beam directed by the object beam optical system and reference beam optical system would penetrate to the crosstalk layer and forming interference pattern within known as the crosstalk hologram. It is implicitly true or obvious modification to one skilled in the art to make the crosstalk hologram also recorded within the crosstalk layer of holographic medium. For claim 16, although this reference does not teach to provide a different optical system for forming the crosstalk hologram, however using different optical system to form hologram in different recording layer is considered to be obvious modification to one skilled in the art for the purpose to form entirely different hologram from the previous set. With regard to claim 17, using different recording beam of different wavelength is common practice in the art to form different hologram.

Colvin et al teaches that the inactive layer has a thickness of about 10  $\mu\text{m}$  to 3 mm, which is greater than 0.48  $\mu\text{m}$ . With regard to claim 18, Colvin et al teaches, with the incorporated reference of US patent 5,719,691, that holograms can be recorded via angular multiplexing, (please see column 2, line 65, and column 1 line 20-22 of patent 5,719,691). Colvin et al teaches that the minimum angle separation for a data page to be recorded angular multiplexing manner is ( $\Delta\theta = \lambda/L$ ), L being the thickness of the

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recording layer and  $\lambda$  being the wavelength of the recording light beam, (please see column 1, line 40).

This means N (number of holograms recorded) cannot be greater than  $(L/\lambda)$ . It is implicitly true that the thickness of the inactive layer could be made less than the thickness of the active layer divided by number of the holograms recorded.

With regard to claims 19 and 20, Colvin et al teaches that a phase mask (11) is placed in the path of reference beam to phase encoding the reference beam and a modulator (29) is provided in the path of object beam to provide amplitude modulation to the object beam. It is implicitly true that one can use any other phase pattern to record the crosstalk hologram as desired.

***Allowable Subject Matter***

9. Claims 8-11 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter: of the prior art references considered, none has disclose a holographic record erasing method that is comprised of forming a crosstalk hologram in a crosstalk layer in a superposed manner with respect to a data holograms multiplexed recorded in a recording layer in a holographic recording medium. The crosstalk layer is provided adjacent to recording layer in the holographic recording medium. A reference beam for erasing, **used to record the crosstalk hologram, has a beam diameter upon the projection unto the holographic recording medium 2 to 10 time the diameter of the beam** which is projected onto the holographic recording medium at the time of data hologram recording.

***Response to Arguments***

11. Applicant's arguments with respect to claims 1-19 and 21 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (9:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

***Audrey Y. Chang, Ph.D.***  
***Primary Examiner***  
***Art Unit 2872***

A. Chang, Ph.D.  
/Audrey Y. Chang/  
Primary Examiner, Art Unit 2872